

Translation

PATENT COOPERATION TREATY

PCT/DE2003/003579



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002P18528WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DE2003/003579	International filing date (day/month/year) 28 October 2003 (28.10.2003)	Priority date (day/month/year) 13 January 2003 (13.01.2003)
International Patent Classification (IPC) or national classification and IPC F02M 37/20		
Applicant SIEMENS AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 15 June 2004 (15.06.2004)	Date of completion of this report 04 April 2005 (04.04.2005)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

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International application No.

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I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
 pages _____ 1-9 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages _____ 1-14 _____, filed with the letter of _____ 21 March 2005 (21.03.2005)
- ☒ the drawings:
 pages _____ 1/3-3/3 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☒ the claims, Nos. _____ 15-18 _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-14	YES
	Claims		NO
Inventive step (IS)	Claims	2, 9	YES
	Claims	1, 3-8, 10-14	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

2. Citations and explanations

This report makes reference to the following documents:

D1: DE 199 51 410 A

D2: EP 1 223 326 A

D2 is not cited in the international search report. A copy of the document is appended.

Novelty: claims 1 and 8 and claims 2 and 9

D1 discloses (the references in parentheses are to D1) a *fuel injection system comprising a fuel reservoir (implicitly provided after the high-pressure pump 3) to which fuel is fed via at least a first pump (2) and from which fuel is discharged via injectors (also implicitly in the internal combustion engine 1), the feed pressure of the first pump (2) being adjusted as a function of the fuel temperature (see, for example, the characterizing part of claim 1) and the evaporative behavior of the fuel (see, for example, claim 10) by a control device (5), which controls the first pump (2).*

The subject matter of claim 1 and thus also the method according to claim 8 differ from that of D1 in that the control device determines the evaporative behavior of the fuel by means of modeling.

The subject matter of claim 2 and thus also the method according to claim 9 differ from that of D1 in that a lambda probe output signal is used to determine the evaporative behavior.

Inventive step: claims 1 and 8 and their dependent claims

The present application fails to meet the requirements of PCT Article 33(1) because the subjects of claim 1 and claims 3 to 7, which are dependent on claim 1, and claim 8 and claims 10 to 14, which are dependent on claim 8, do not involve an inventive step within the meaning of PCT Article 33(3).

The subject matter of claim 1 and that of claim 8 differs from the fuel injection system of D1 merely in that, instead of the fuel quality being measured directly, a model is used. The objective problem is therefore that of determining the evaporative behavior of the fuel without using an additional sensory mechanism.

However, it is already known to determine the evaporative behavior of fuel by means of modeling from other variables determined in another way: for example, D2 suggests using the cranking enrichment factor and other variables such as variation of the engine speed at start-up, external temperature, start of injection, throttle angle, etc., for assessing the evaporative behavior (see description, column 12, line 35 to column 13, line 8). D2 also suggests using this assessed evaporative behavior for influencing a large number of parameters of normal engine operation (see description, column 13, lines 9-18).

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A person skilled in the art would therefore consider the incorporation of this feature in the described fuel injection system to be a conventional structural measure.

Inventive step: claims 2 and 9 and their dependent claims

The use of the lambda probe output signal for determining the evaporative behavior is not suggested by either D1 or D2. The combination of features of claims 2 and 9 and their dependent claims is therefore considered to be non-obvious from the prior art.

Industrial applicability

The subject matter of the claims is clearly industrially applicable.